Section 2
Site Description

The Kalamazoo River drainage basin encompasses approximately 2,000 square miles. The main stem of the Kalamazoo River begins in Albion, Michigan at the confluence of the North and South Branches of the Kalamazoo River, and flows northwesterly for 123 miles through Calhoun, Kalamazoo, and Allegan Counties to Lake Michigan at Saugatuck. The Kalamazoo River is fed by more than 400 miles of tributaries, including Portage Creek. Portage Creek begins in Portage, Michigan and including its west fork, flows a distance of approximately 18.5 miles.

Due to the PCB contamination, in August 1990 the site was placed on the National Priorities List (NPL) in accordance with the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA), 1980 PL 96-510 as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986 also known as Superfund. The NPL Study Area defined (also known as the API/KR/PC) includes three miles of Portage Creek, from Cork Street to its confluence with the Kalamazoo River, and 80 miles of the Kalamazoo River, from Morrow Lake Dam downstream to Lake Michigan (Figure 2-1). Also included in the site are five paper residual disposal areas and five paper mill properties. Paper residuals (residuals) are the waste material produced by the paper mill during the paper making process. The Michigan Department of Community Health has issued a species-specific no consumption fish advisory annually since 1977 for the Kalamazoo River portion of this site due to the PCB contamination. The Kalamazoo River and Portage Creek have been designated a site of environmental contamination under Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA), due to PCB contamination. The Kalamazoo River and Portage Creek have also been identified as an Area of Concern by the International Joint Commission on the Great Lakes due to the detrimental impact the release of PCBs have on Lake Michigan.

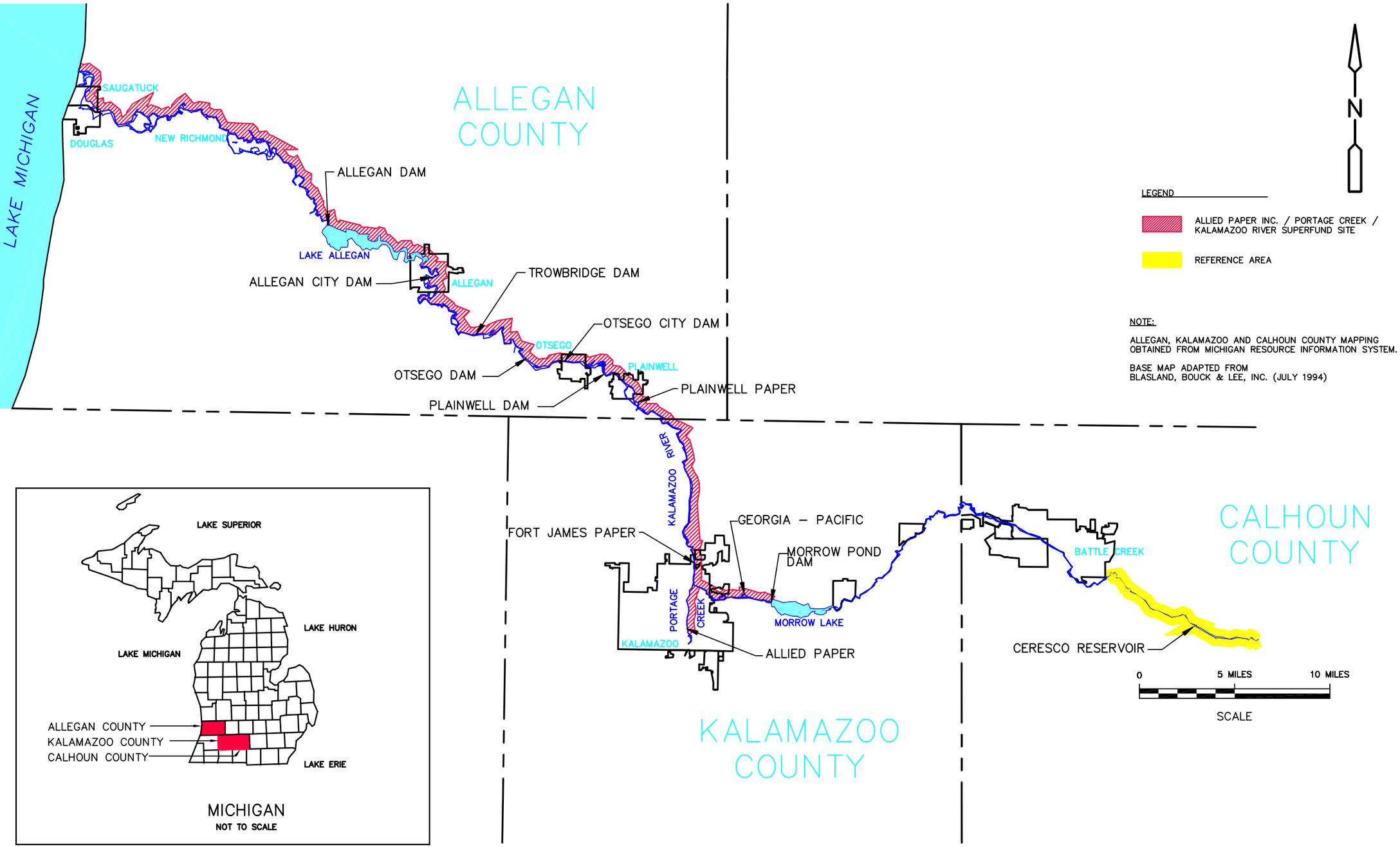
The Kalamazoo River is an alternating series of free flowing sections and impoundments formed by low level dams. The Plainwell, Otsego, and Trowbridge Dams have been removed to their sill levels, exposing approximately 507 acres of former sediments as floodplain soils (Blasland, Bouck & Lee, Inc. 1992). Since these impoundments are all located downstream of the paper mills and landfills, which are the PCB sources, they serve as natural sinks for PCB-contaminated sediments. The former dams continue to impound water but to a lesser extent than when dams were operational. The Michigan Department of Natural Resources (MDNR) owns these three dams and their goal is to remove the remaining structures and return the river to its natural channel. The Otsego City Dam, Allegan City Dam, and the Calkins Dam (Allegan Lake Dam) are still intact. The Calkins dam is used to produce hydroelectric power (Blasland, Bouck & Lee, Inc. 1992).

The NPL identified PCBs as the primary contaminant of concern at the API/PC/KR. PCBs were introduced to the environment as a result of using the river for

discharging of waste. The primary industrial activity associated with PCB releases into the API/PC/KR environment was the recycling of PCB-containing carbonless copy paper at several area paper mills. In the process of de-inking and re-pulping recycled paper, paper mills produce substantial quantities of waste residuals. During the period from 1957 to 1971, carbonless copy paper contained PCBs as an ink solvent. Kalamazoo-area paper mills that de-inked or re-pulped the PCB-containing carbonless copy paper thereby incorporated PCBs in their waste streams. These paper mills disposed of their wastes in several ways that resulted in releases of PCBs to the environment, including direct discharge of wastes to Portage Creek and the Kalamazoo River and placement of wastes in disposal areas (landfills) from which PCBs are leached or eroded. The paper wastes also included kaolinite clays, which can be significant sorbents of PCBs, primarily as a result of surface area. These clays have been deposited in the API/PC/KR and when concentrated, they appear as spongy, light grey clay layers. In addition, PCBs are persistent in the environment and degradation via chemical oxidation, hydrolysis, and photolysis in soil or aquatic systems is generally insignificant (Blasland, Bouck & Lee, Inc. 1992). PCBs are continually being released to the river from erosion of floodplain soils that exist behind the impounded areas and from instream sediments. Therefore, PCBs are a persistent problem at the API/PC/KR. Similar river systems such as the Fox River (WDNR 1993) and the Hudson River (Brown, et al. 1985) have PCB contaminated sediments that are the major supplier of PCBs to the ecosystem once direct discharges have been eliminated.

Figure 2-1A, in *Description of the Current Situation Report* (Blasland, Bouck & Lee, Inc. 1992) provides a more detailed description of the physical settings and characteristics of the API/PC/KR. Much of the abiotic data used in this ERA were obtained from this report.

In 1993, Camp Dresser & McKee (CDM) prepared a Biota Sampling Plan (CDM 1993) that outlined sampling activities for the collection of biotic data within the study area. Sampling of biota was conducted to determine current levels of PCBs in resident biota. Based upon these field studies a site-specific model was developed to evaluate bioaccumulation and risk, upon which remedial activities may be based. Field sampling was conducted by Blasland, Bouck & Lee, Inc., with oversight by CDM and the Michigan Department of Environmental Quality (MDEQ) or by the MDEQ. Biological tissue and corresponding abiotic media data collected in the study area were used in this ecological risk assessment.



ALLIED PAPER, INC./PORTAGE CREEK/KALAMAZOO RIVER SUPERFUND SITE

KALAMAZOO RIVER ECOLOGICAL RISK ASSESSMENT STUDY AREA

CDM
environmental engineers, scientists, planners, & management consultants

Figure No. 2–1

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